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ECOLOGICAL AND DISTRIBUTIONAL NOTES
ON *EREBIA DISCOIDALIS* (SATYRIDAE)
IN THE NORTH CENTRAL STATES

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EREBIA DISCOIDALIS KIRBY IS ONE OF THE MOST WIDESPREAD *Erebias* in North America, occurring from Alaska to Churchill, Manitoba and then southward, principally in bogs, to Northcentral Minnesota and Wisconsin and Central Ontario. However, its range has been poorly documented and prior to 1964 only four specimens had been recorded from the United States: Elder (1961) took three specimens over a three year period (1929-1930) in Forest County, Wisconsin and Daggy (1936) took a single specimen from Clearwater County, Minnesota on 31 May 1935. Huber (1965) rediscovered the species in Minnesota (Lake County, 24 May 1964) and in the six years since then it has been consistently taken in Minnesota, rediscovered in Wisconsin and first recorded for Michigan and North Dakota.

I found *Erebia discoidalis* to be quite widespread, although uncommon and intensely local, in the Canadian Zones of these states. It was, for the most part, restricted to sphagnum bogs. It seems unlikely to me that the species has extended its range in recent years. A more likely explanation for the paucity of records in the past is that it has simply been overlooked by collectors as a result of a combination of an early season flight period, the habitat preference for bogs and a habit of preferring to fly either quite early or very late in the day.

Unlike *Erebia disa* (Thunberg) which is found in bogs containing dense stands of spruce (Masters, 1969), *E. discoidalis* seems to prefer bogs with large open areas, lots of grass and only a few trees, however they are usually encountered near the edges of these bogs or in close proximity to trees except during the

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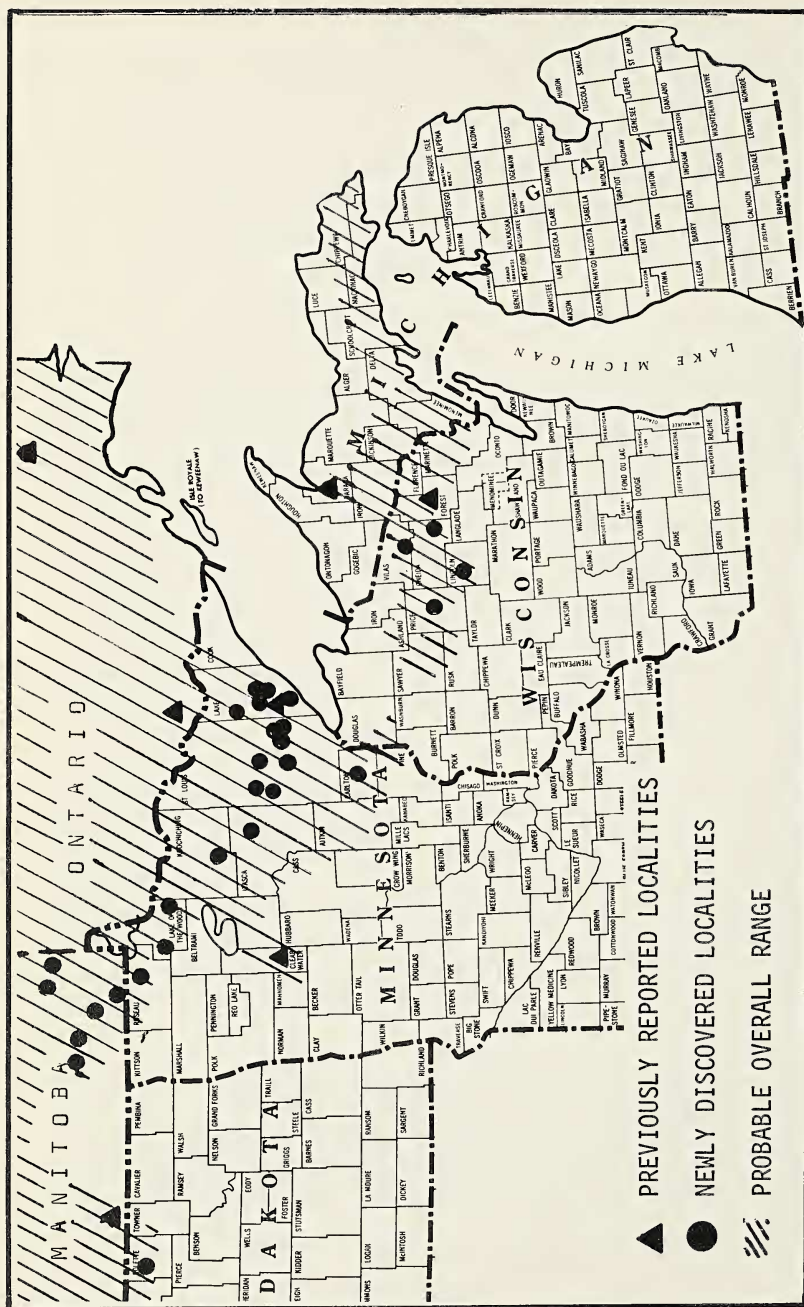


Fig. 1.—Map of the Northcentral Area, showing localities from which *Erebria discoidalis* has been recorded and the suggested overall range.

evening hours when they move into the open areas. *Erebia discoidalis* is fairly conspicuous in flight, normally flying slowly, weakly and close to the ground, but, if alarmed, can quickly rise into the wind to be blown out of range in what Ehrlich (1956) refers to as "the tundra butterflies favorite tactic". At other times, an alarmed butterfly will "dig" into the grass or sphagnum mat, rather than taking wing, in order to avoid a would be predator or captor. They normally light down low in the grass or sphagnum and I have never seen them light on tree trunks in the manner of *Erebia disa*, nor have I ever observed them to visit flowers of any kind. Unlike *Oeneis* sp. (see Masters and Sorensen, 1969) they are not "territorial" nor are they "pugnacious" towards each other or other butterflies. Mate seeking by males seems to be a weak form of patrolling without orientation.

Erebia discoidalis has a decided flight preference for early morning (before 10:00 A.M.) or late afternoon (after 4:00 P.M.) flight, in this respect being much like *Erebia disa* (Masters, 1969). Mid-day flight seems to be stronger on partly cloudy or overcast days, but they avoid flying in rain or on heavily clouded days. Miller (1968) suggests that the crepuscular flight habits of many satyrid butterflies may be a mechanism by which they try to approximate the light intensity conditions of the deep forest (which is apparently the ancestral habitat of the Satyridae). This explanation seems only partially satisfactory to me since many species that are still associated with deep forest conditions (e.g. *Erebia disa*) also exhibit pronounced crepuscular activity. On a couple of occasions, I have observed male *discoidalis* sitting at cool damp spots in a gravel road during the hot afternoon hours.

The seasonal flight of *Erebia discoidalis* is quite early; specimens have been taken in the Northcentral States as early as May 10th and as late as June 18th with peak flights usually occurring during the last week of May. Only *Celastrina argiolus* Linnaeus and hibernating *Polygonia* and *Nymphalis* spp. are on the wing earlier. *Incisalia augustinus* Westwood and *Boloria freija* Thunberg fly at approximately the same time while *Pieris*

napi Linnaeus and *Incisalia niphon* Hubner are a week to ten days later. *Erebia discoidalis* has an annual flight and apparently a one year life cycle, unlike *Erebia claudia* (and possibly *Erebia disa*) which has a biennial flight and a two year life cycle. However, there does seem to be considerable fluctuation in numbers from year to year; Krivda (1968) attributed this to predation by a field mouse, *Microtus pensylvanicus drummondi*.

There is one large field at McNair, Lake County, Minnesota where *Erebia discoidalis* occurs abundantly in a non-bog environment and Krivda (1968) records it in a similar field at The Pas, Manitoba. Interestingly, both of these fields are at the site of former saw mills and contain considerable amounts of sawdust, which creates very acid conditions, in their soils. Also, both sites are surrounded by bogs. Krivda established that the larval food plant at the field at The Pas is *Poa lucida*, an acid loving grass that is not native to the region. Since all of the other localities from which *Erebia discoidalis* has been observed in the Northcentral Region have been bogs, I consider these two sites atypic. For the population west of the Rockies (ssp. *mcdunnoughi* dosPassos) the typical habitat may be somewhat different. Ehrlich (1956) spoke of it as "an insect of open, dry, grassy areas" occasionally "at or above treeline but definitely not a tundra species."

The map (Fig. 1) indicates those localities in the Northcentral States, and adjacent portions of Canada, where *Erebia discoidalis* has been taken. These records are summarized below:

MANITOBA: Cartwright, E.F. Heath (Wolly-Dod, 1916); Sandilands Prov. Forest, several localities from Richer to Piney, WAB, PJC, JHM, JP, CSQ, JTS; Seven Sisters, CSQ; White-shell Prov. Park, JHM. The localities cited are all from southeastern Manitoba, for other Manitoba records refer to Brooks (1942) or Masters (1970).

MICHIGAN: Barga County, 3 miles southwest of Baraga, JHM (Nielsen, 1970).

MINNESOTA: Carlton County, Fond du Lac State Forest, JHM; Clearwater County, Itasca State Park, (Daggy, 1936); Itasca

County, near Togo, WAB; Koochiching County, Northwest of Craigville, JTS; Lake County, McNair, RLH (1965), EMB, WAB, JHM, JSN, JTS, 4 miles south of McNair, JHM, Northshore Junction, JHM, PJC, Jordan, PJC, Alseth Lake, WAB, near Farm Lake, WAB, JHM; Lake of the Woods County, Carp, JSN, Norris Camp, NF; Roseau County, Roseau, NF; Saint Louis County, Linden Grove, WAB, PJC, RLH, JHM, JSN, Cook, WAB, JHM, nr. Pfeiffer Lake, WAB, Brimson, JHM, Toimi RLH, JHM, JTS, Fairbanks, JHM, Makinen, JHM.

NORTH DAKOTA: Rolette County, Turtle Mountains, JHM.

ONTARIO: Riotte (1970) records the following localities in Northern Ontario: Charlton, Driftwood, Fort Severn, Geraldton, Lansdown House, Longlac (30 miles east of), Malachi, Monteith, Nakina, Quetico Park, Smoky Falls, Sudbury.

WISCONSIN: Forest County, Argonne, Elder (1961); Lincoln County, Highway 8 between Tripoli and Bradley, JHM; Oneida County, 2 miles north of Rhinelander, JHM; Price County, near Phillips, JHM; Vilas County, four miles west of Eagle River, JHM.

Collectors cited by initials: EMB, Dr. E. M. Brackney, Minneapolis; PJC, Patrick J. Conway, Chicago; WAB, William A. Bergman, Minneapolis; RLH, Ronald L. Huber, Saint Paul; NF, Norman Flagstaff Jr., Roseau, Minnesota; JHM, John H. Masters; JSN, John S. Nordin, Webster, South Dakota; JP, John Polusny, Winnipeg; CSJ, C. S. Quelch, Transona, Manitoba; JTS, John T. Sorensen, Minneapolis.

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